

EMSC Connects

Volume 5, Issue 4

April 2016

Emergency Medical Services for Children Utah Bureau of EMS and Preparedness

Special points of interest:

- Congenital Heart Defects
- A case study; coarctation of the aorta
- Non-Traumatic Shock/Sepsis

Inside this issue:

Pedi Points	2
Expert Input	2
Protocols in Practice	4
News from National	5
Calendar	6
Happenings	7

A Word From Our Program Manager

Though this month's newsletter is devoted to cardiac emergencies, the EMSC program are sponsors of the upcoming Zero Fatalities Safety Summit. This conference will be held in Provo on April 13-14, 2016. It's not too late to register. Why is this conference important? It is important because motor vehicle deaths are the major cause of death for children 14 and under. According to the Utah Fact Sheet from the Children's Safety Network, 30 percent of children ages 0 to 14 involved in motor vehicle fatalities were pedestrians and 19 percent were occupants. These statistics may reflect that the children were not restrained properly in the vehicle or were not aware of road safety as a pedestrian. It's important for us to understand the cause and strategies to prevent fatalities and injuries from traffic related incidents.

In 2015, Utah had 176 days with Zero Fatalities on the roads. The Utah Highway Safety Office is trying to make all of their Zero Fatality messages about personal responsibility and accountability. Kristy Rigby, Director of the Utah Highway Safety Office, stated that, "We are striving to compel every person who uses our roads to do their part to keep themselves and those around them safe. If we focus on some basic behaviors individually, then *collectively*, we'll be able to reach our ultimate goal. If you visit ut.zerofatalities.com you can view some of these messages."

April is also distracted driving awareness month. The National Safety Council has some excellent resources available to promote distracted driving awareness. The website is <http://www.nsc.org/learn/NSC-Initiatives/Pages/distracted-driving-awareness-month.aspx?var=hpddam>

There is also a pledge that can be promoted

regarding cell phone use and driving:

"I pledge to *Take Back My Drive* for my own safety and for others with whom I share the roads. I choose to not drive distracted in any way - I will not:

- Have a phone conversation - handheld, hands-free, or via Bluetooth
- Text or send Snapchats
- Use voice-to-text features in my vehicle's dashboard system
- Update Facebook, Twitter, Instagram, Vimeo, Vine or other social media
- Check or send emails
- Take selfies or film videos
- Input destinations into GPS (while the vehicle is in motion)
- Call or message someone else when I know they are driving"

These materials, messages and targeted injury prevention programs may help to save lives, one at a time. EMS is the safety net when interventions fail. However, EMS personnel are key influencers in helping to spread the message and in conducting outreach education and prevention in our communities. You can make a difference, in so many different ways, within communities, within our own families and in our own lives.

Thank you for the difference you make, the lives you touch and your continued efforts to improve the medical care to children in Utah.

Jolene Whitney
jrwhitney@utah.gov



To submit or subscribe to this newsletter

Email: TDickson@utah.gov

Pedi Points

Tia Dickson RN, BSN

Our respiratory season this year has been a long one. We've seen many little ones in respiratory distress and we know how to respond. During the months of October to April providers hone their suctioning, positioning, and oxygen delivery skills. We almost become mindless in our response because so many children present in the same way. Congestion, cough, even cyanosis rarely ruffles our feathers however we should keep in mind that that presentation does not always mean what we think it does. In fact, during the respiratory season primary cardiac presentations are often missed.

A congenital heart defect (CHD) is a problem with the structure of the heart. The defects can involve the walls or valves of the heart and/or the arteries and veins near the heart. They can disrupt the normal flow of blood through the heart. The blood flow can slow down, go in the wrong direction or to the wrong place, or be blocked completely. CHDs are the most common type of birth defect. They affect 8 out of every 1,000 newborns. Each year, more than 35,000 babies in the United States are born with congenital heart defects.

Many of these defects are simple conditions. They need no treatment or are easily fixed. Some babies are born with complex congenital heart defects. These defects require special medical care soon after birth but some go undetected until the child is older.

EMS may encounter these children in the field. According to one study, "the key to successful prehospital management of CHDs is identifying the cardiac anomaly, obtaining an effective history and physical assessment, and providing supportive care. When obtaining a history, it is important to remember that parents know their children and their children's diseases very well. An EMS provider who ignores information from a parent is doomed to failure. Realizing that most EMS providers are not well-versed in the various CHDs and are not likely to have a great deal of experience in working with CHD patients, conferring with medical control prior to initiation of any treatments is strongly encouraged. EMS providers should not be concerned with diagnosing specific defects, but should be aware of the global effects that various defects have on normal perfusion. EMS providers' comprehension of the pathophysiology of CHDs and prompt actions will play a vital role in the outcome of the acutely ill CHD patient.¹"

When transporting patients with CHDs EMS providers should watch and treat for signs of shock. A faulty pump (cardiogenic shock) or obstructed vessels (obstructive shock) can quickly lead to decompensation. Don't just assume that all "blue babies" are in respiratory distress. Most are, but some have a primary cardiac reason for their appearance. Fortunately for us, treatment for both conditions starts with the ABCs.

1: Krost W. *Deadly defects. Managing the pediatric patient with a congenital heart defect.* Emerg Med Serv. 2003 Jul; 32(7):55-9.

Expert Input

Cory Oaks FP-C, NR-P, MPA Captain, Provo Fire Rescue
Regional Education Coordinator Classic Air Medical

Complacency is an enemy of any EMS provider no matter how long you have been in the field or how experienced you may be. Our failure to continually strive to learn new things can be detrimental to our patients. The question is, "do you really know what you don't know?" This rings true when faced with out of the norm situations. This was made evident to me when we responded to a call at a Physician's office for a reported infant with respiratory distress.

After checking en-route we were given an informational update by dispatch that our patient was a few weeks old. He presented at the office with a sudden onset of respiratory distress and poor oxygenation as represented by SpO2 and outward appearance.

We were met upon arrival by a distraught mother and their family physician. Our patient was showing marked signs of respiratory distress (tachypnea, dyspnea with an outward pale appearance). His saturations were in the high 80's via SpO2. Prior to leaving the scene the physician requested transport to the a pediatric level I trauma center. We were less than four blocks from a level II trauma center and suggested that should be our transport destination. The physician was initially resistant, but quickly came on board when the difference in transport



"Congenital Heart Defects are the most common type of birth defect. They affect 8 out of every 1,000 newborns."



Expert Input-continued

times (and associated patient condition) were presented. He did adamantly request to accompany us in the ambulance during transport.

During the course of the short transport we supported oxygenation via mask and continually reassessed. The patient showed little signs of improvement other than a minor increase in his SpO₂. He continued to remain cyanotic and dyspneic. We transferred care to the ED staff at the level II center where he was diagnosed with a coarctation of the aorta and was transported by air to a pediatric level I trauma center.

Coarctation of the Aorta is a congenital defect accounting for 5% to 8% of congenital heart defects. It affects males twice as often as females. It results from a stricture or constricting of the Aorta, it can be associated with the closing of the patent ductus arteriosus (PDA)

At approximately 2-7 weeks of age, the PDA closes as the heart transitions to the normal physiological blood flow it will experience for the duration of our lives. When a coarctation exists, and the PDA closes, blood flow to the vasculature is restricted. This causes an increase in backpressure in the heart as well as a decrease in systemic blood flow downstream resulting in classic signs and symptoms of hypoxia and shock.

In cases like this, unfortunately for prehospital responders, there is little we can do other than support oxygenation and maximize its delivery to the body, but recognition of the condition is key so transport and transfer to the appropriate facility can be made.

So how would this patient present? Because the stricture is distal to the three ascending branches of the Aorta, only a portion of the body is affected and normal blood flow is seen in the parts fed by the vasculature pre-coarctation.

Our patient can present with the following signs and Symptoms:

- Decreased or altered level of consciousness as the body becomes systemically hypoxic.
- History of poor feeding or fussiness.
- Respiratory distress/failure with dyspnea and tachypnea
- Some patients may have been diagnosed with a heart murmur.

As we all know, all of the above are not solely unique to this condition and may be associated with many other processes. However, the following can clue us in to it as a differential diagnosis, and these are fairly unique to the presence of a Coarctation.

- Absent or diminished palpable pulses in the lower extremities.
- A differential cyanosis between the upper and lower extremities.
- Blood pressure discrepancies between the upper and lower extremities.

Upon our arrival at UVRMC and the subsequent assessment of our patient was quickly diagnosed with the coarctation and air medical transport to Primary Children's Hospital was completed where the condition was fixed surgically with no complications.

Food for thought...

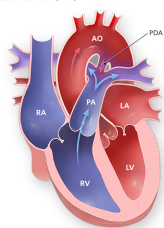
Was our patient transported to the closest APPROPRIATE facility?

With careful evaluation we decided that although the patient needed surgical intervention at a Children's Hospital, at the time, we had not definitively identified the patient's condition. Our decision to transport to the closest facility was based on our provider's impression of respiratory distress and apparent state of hypo perfusion.

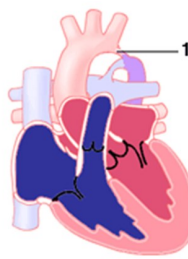
Was the decision to allow the family practice physician to accompany our patient during transport appropriate?

Although this is a grey area within EMS, always make sure you follow your local protocols and when in doubt lean on your medical control. Sometimes a *physician to control physician* phone call can alleviate all of our headaches. In our case we decided that the decision to allow him to accompany us was more time effective in getting our patient to the care he needed. The physician did not attempt to perform, or requested us to perform, interventions outside of our scope of practice.

Patent Ductus Arteriosus (PDA)



Before a baby is born, the fetus's blood does not need to go to the lungs to get oxygenated. The ductus arteriosus is a hole that allows the blood to skip the lungs. However, when the baby is born, this hole is supposed to close. If the ductus arteriosus is still open (or patent) it may disguise cyanotic congenital heart defects. By the age of one month this hole usually closes. Providers should consider cardiac causes for those with a history of sudden onset of fussiness, respiratory distress, and cyanosis in those less than one month of age.



Coarctation of the aorta



Protocols in Practice

Non-Traumatic Shock/Sepsis

Definition: Hypoperfusion or shock is defined as decreased effective circulation, with inadequate delivery of oxygen to tissues. Shock may be present in a compensated state (normal blood pressure) or in a decompensated state (low blood pressure).

Hypovolemic shock (cold shock state) is most common cause in pediatrics due to fluid losses from dehydration.

Distributive shock (warm shock state) is from inadequate fluid distribution causing hypoperfusion. Examples include septic shock or anaphylaxis.

Obstructive shock is from physical obstruction of the great vessel of the heart preventing adequate fluid distribution.

Cardiogenic shock decreased oxygen delivery to tissues due to a faulty pump (heart)

Clinical Presentation: **Cold shock:** increased heart rate, prolonged capillary refill >3 seconds, cool pale, clammy, or mottled skin, weak or absent peripheral pulses and altered mental status. **Warm shock:** increased heart rate, "flash" capillary refill time, warm, flushed skin, bounding peripheral pulses, increased respiratory rate, mental status decreased or confused.



"Patients who are in a cardiogenic shock state may worsen after fluid resuscitation"

Basic Life Support

1. Refer to *General Pediatric Assessment Guidelines*
2. Obtain vital signs including blood pressure
3. Maintain airway, administer 10-15 lpm of oxygen if signs of respiratory distress
 - a. If respirations are ineffective, begin BVM ventilation
 - b. Suction as needed
4. Transport for medical evaluation

Advanced Life Support

1. Follow BLS procedures
2. Place patient on cardio-respiratory monitor and continuous pulse oximeter
3. Consider intubation if unable to effectively ventilate with BVM
4. Obtain IV/IO and initiate 20 ml/kg of NS or LR
5. Contact medical control as soon as possible to mobilize resources at receiving facility
6. Reassess patient perfusion status including vital signs
 - a. If patient is persistently hypotensive or with signs of poor perfusion, repeat 20 ml/kg of NS or LR
7. Transport for medical evaluation

Key Considerations

1. Patients who are in a cardiogenic shock state may worsen after fluid resuscitation. If cardiac conditions are suspected resuscitate with 10cc/kg of NS and reassess.
2. Reassessment between fluid boluses is very important component of care.



News From National (NEDARC)



QUALITY IMPROVEMENT ASSESSMENT OPPORTUNITY!



Based on the success of the initial assessment for the National Pediatric Readiness Project* conducted in 2013-14, the web-based “portal” is once again open for local facilities and regions engaged in **quality improvement efforts** to assess their score and their readiness to care for children!

Key points for facilities assessing their pediatric readiness:

The Assessment Portal (www.pedsready.org):

- Uses the same interface as in 2013-14; ED personnel can select their state and county in which their hospital is located, and then choose their hospital.
- If a hospital’s name does not appear in the portal, it can be added by following the instructions provided on the website.
- Upon completion of the assessment, respondents will receive an electronic gap analysis report containing their new Readiness Score, compared to their 2013-14 Readiness Score (if applicable), as well as a breakdown of the overall scoring.
- The assessment will be **open for approximately 10 months**. During this time period every hospital can complete the assessment one time and receive their new readiness score.

Please visit www.pedsready.org, to see how your quality improvement efforts are helping to improve care for children!



April 2016

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1 EMS Instructors Con Ephraim Utah	2
3	4	5	6	7 PGR	8	9 Renewal PEPP Price
10	11 Initial PEPP UVU →	12	13 Zero Fatalities Safety Summit →	14 PGR	15	16 Renewal PEPP Willard
17	18	19	20	21 TGR PGR	22	23 NUTS Conference
24	25	26	27	28 PGR	29 EMS Instructors Con Salt Lake City Utah	30

Pediatric Education Around the State

Pediatric Grand Rounds (PGR) are educational/CME offerings webcast weekly (Sept-May) you can watch live or archived presentations. It is geared towards hospital personnel. But will certify as BEMSP CME Access at <https://intermountainhealthcare.org/locations/primary-childrens-hospital/for-referring-physicians/pediatric-grand-rounds/>

Trauma Grand Rounds (TGR) This free offering alternates with EMS Grand Rounds every other month, it is geared towards hospital personnel.

April 21st "Resuscitation Strategies of Trauma"- Raminder Nirula, MD, MPH

There are 3 ways to participate

- Attend in person 0700-0800 Classroom A SOM University Hospital.
- Attend live via the internet at : <http://utn.org/live/trauma/> To receive CME for viewing via live stream, please send an email with your name and the presentation you viewed to zachery.robinson@hsc.utah.edu. A CME certificate will be emailed to you within two weeks.
- View the archived presentation two weeks after the live date at www.healthcare.utah.edu/trauma

Upcoming Peds Classes, 2016

For PEPP and PALS classes throughout the state contact Andy Ostler Aostler@utah.gov

Initial PEPP classes

- April 11-12 (8a-4p) UVU, Provo

Renewal PEPP classes

- April 9 (9a-4p) Carbon Co, Price
- April 16 (9a-4p) Willard City Hall, Willard

For PALS and ENPC classes in Filmore, Delta and MVH contact Kris Shields at shields57@gmail.com

Save the Date

April 13-14, 2016 Zero Fatalities Safety Summit scholarships are available for EMS but you must act quickly.

April 23, 2016 Northern Utah Trauma Conference (**NUTS**)

June 16-18, 2016 EMSC Coordinators Workshop



Emergency Medical Services for Children

Utah Department of Health
Emergency Medical Services and Preparedness
Emergency Medical Services for Children
3760 S. Highland Drive, Room 545
Salt Lake City, UT 84106

Phone: 801-707-3763
E-mail: TDickson@utah.gov
Salt Lake City, UT 84114-2004



Follow us on the web
<http://health.utah.gov/ems/emsc/>
and on Twitter: EMSCUtah

The Emergency Medical Services for Children (EMSC) Program aims to ensure that emergency medical care for the ill and injured child or adolescent is well integrated into an emergency medical service system. We work to ensure that the system is backed by optimal resources and that the entire spectrum of emergency services (prevention, acute care, and rehabilitation) is provided to children and adolescents, no matter where they live, attend school or travel.

Happenings

Millions of people worldwide practice how to [Drop, Cover, and Hold On](#) each year during [Great ShakeOut Earthquake Drills!](#)

Utahns can join them by [registering](#) today for the **Great Utah ShakeOut**. The 2016 Utah ShakeOut Day of Action is on April 21, though you can register to hold your ShakeOut drill on any day of the year.

Participating is a great way for [your family or organization](#) to be prepared to survive and recover quickly from big earthquakes – wherever you live, work, or travel.

The Great Utah ShakeOut is also a major activity of [America's PrepareAthon!](#)

